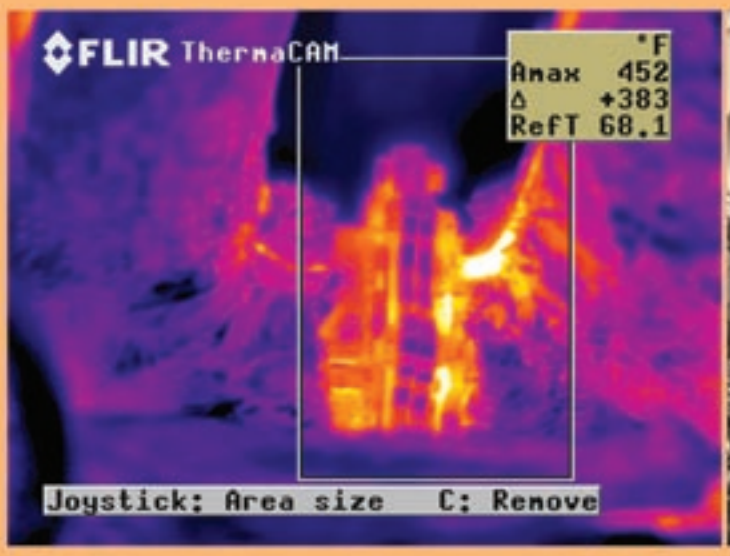
imperative for us to recognize the need for identifying and preventing problems in the earliest stages of failure—like our commercial counterparts do.

The component being evaluated can be classified as to the level of severity and can be made an "emphasis item" at the next inspection. The primary benefit of predictive maintenance is that it allows us to analyze and efficiently plan for repairing an item and to make the repair at an acceptable and convenient time.

heat-generating components can lead to a potentially inaccurate diagnosis. IRT can determine if a hydraulic component is deteriorating.

Engine analysis

Engine analysis on an operating engine is difficult and, in all cases, exposes maintenance technicians to harmful and risky troubleshooting. Using the uncalibrated "hand method" to check for hot-air leaks is dangerous and can burn a technician. IRT allows for safe,



Abnormal heat loss and a temp increase is visible in this shot.

S-3B crossover valve used in the test.

Uses of IR thermography

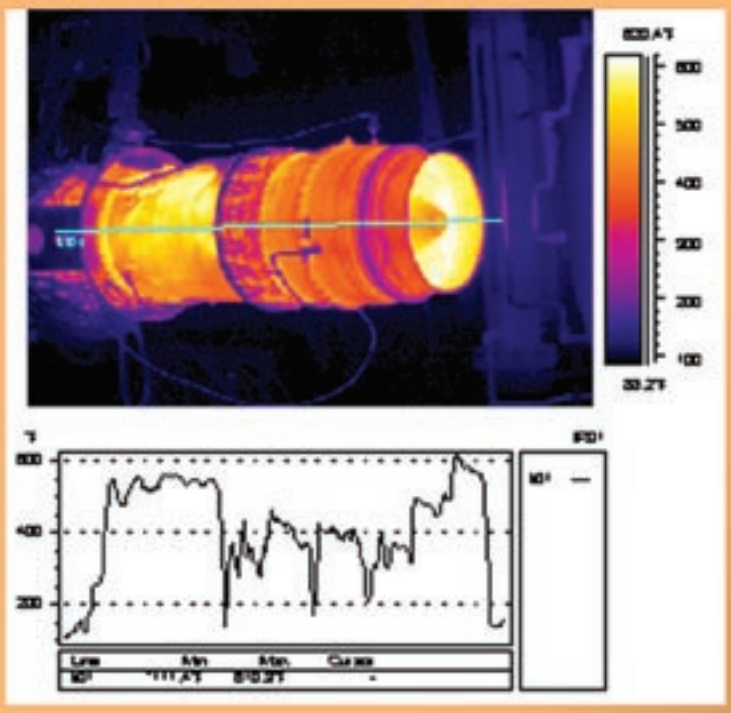
Electrical equipment

These items most commonly are used for infrared technology. All maintainers know new components begin to deteriorate as soon as they are installed. Fluctuating and continual loads, harmonic or equipment vibration, age, and unstable operating environments contribute to the faults in electrical components. If not identified, these faults eventually will lead to catastrophic failures. Roughly 75 percent of identified hot spots are loose connections, bad terminals or splices, and deteriorating wire problems. Navy carrier aircraft are subjected to these constant vibrations, harsh environments, and severe flight conditions. Using high-resolution imaging for periodic electrical inspections easily can identify potential problems and repairs can be expedited before catastrophic damage occurs.

Hydraulic valves (actuators)

Heat is a good indicator of a defective, or soon-to-be-defective, hydraulic valve. The force of fluid moving through a leak or restriction will produce heat; however, not every leaking hydraulic valve will produce heat. The proximity of the valve, to other

Engine analysis is much easier and safer using thermography.



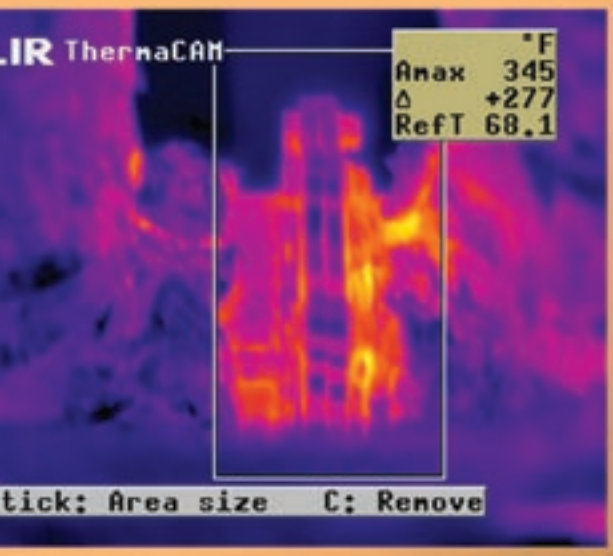
"World-class organizations do not tolerate preventable accidents." –Donald Rumsfeld, SecDef

passive, standoff review of an engine under test. It also allows a technician to "see" the areas of the engine that have caused malfunctions to occur.

Undetected and repeat problem areas often overlooked now can be troubleshot thermally.

Environmental control systems

Like the engine's uncalibrated hand or "red rag" method, environmental-control systems (ECS) can be scanned easily and effectively for hot bleed-air leaks in a matter of minutes. Many AMEs know the headaches



The same valve after tightening the bolts.

of looking for these type problems. With infrared thermography, small leaks can be pin-pointed, removing the guess factor that leads to the removal and replacement of non-failed components.

Safety

IRT gives the maintenance department several new options to look at unresolved discrepancies. This equipment primarily incorporates new safety measures never available before.

Now we can "see" potentially catastrophic electrical-component failures. We also can do away with hand checks and engine analysis done too close to an operating engine. The ability to discuss, analyze, and record the test results is exclusive to this technology only. NATEC 3.7 Engineering Technical Services at NAS North Island continues to explore improvements in aviation-maintenance technology and safety.

Mr. Figg is a technical representative at NATEC North Island.

Aircraft	Command	Date
F-14A	VF-211	10/01/2003

Aircraft sustained damage on arrested landing.

FA-18E	VFA-115	10/09/2003

Port main-landing gear forward door departed aircraft in flight.

AV-8B	VMA-223	10/19/2003

Aircraft starboard wing damaged after bird strike.

F-14B	VF-143	10/24/2003

Port engine ingested ACLS-beacon antenna during in-flight refueling.

FA-18E	VFA-115	11/08/2003

Port main-landing gear forward door departed aircraft in flight.

F-14D	VF-213	12/05/2003

Aircraft canopy jettisoned while on deck.

F-14B	VF-143	12/07/2003

During aircraft refueling, basket separated from fueling aircraft and FODed an engine.

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